

Example from profile Rolling Mill

Fig. 1

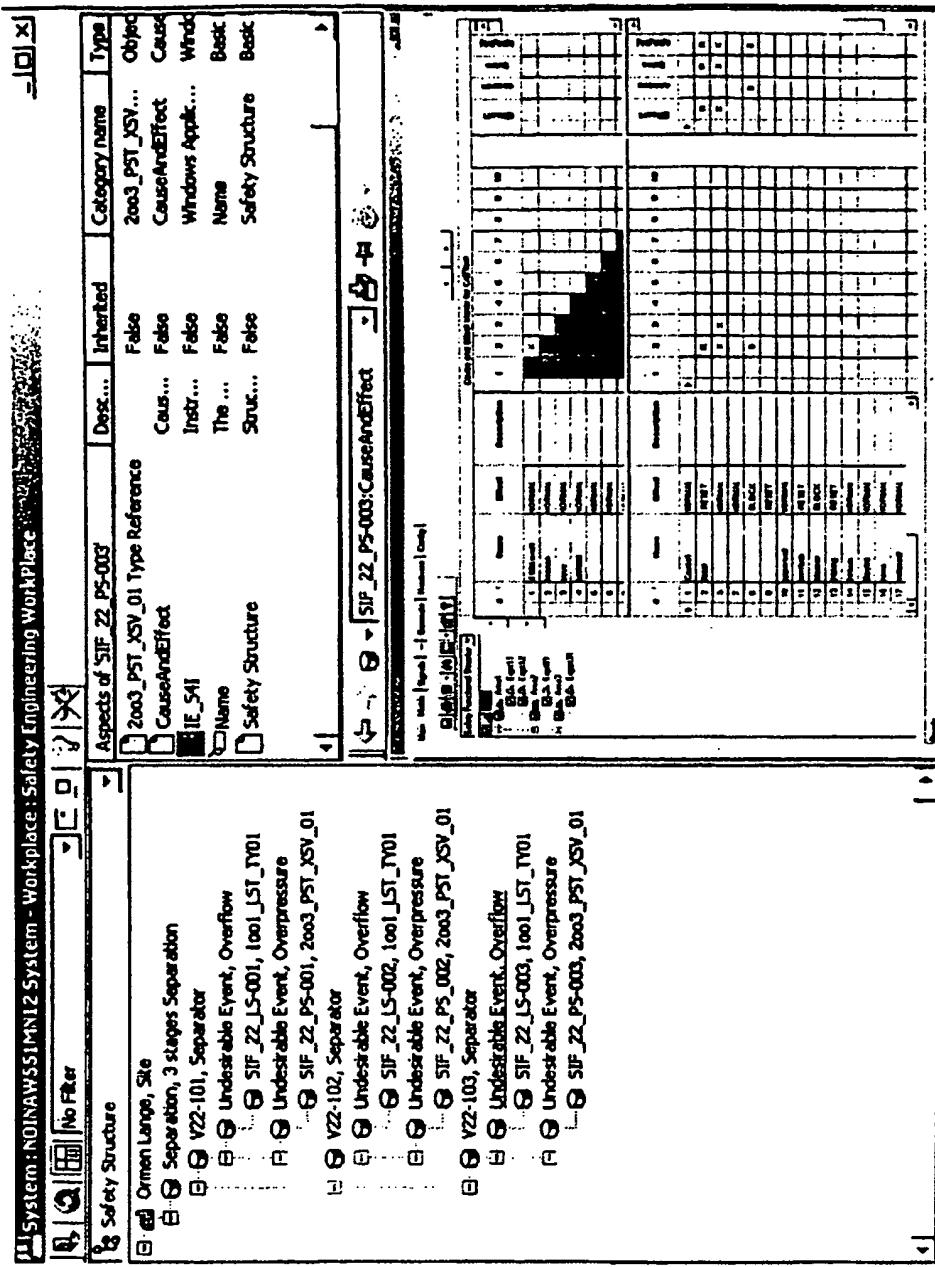
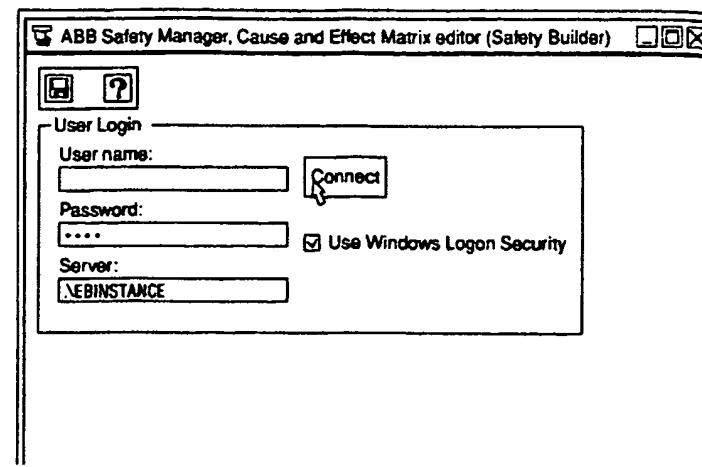
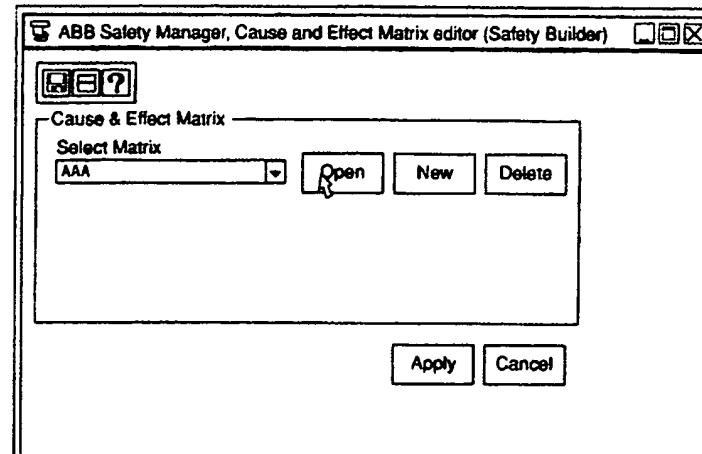


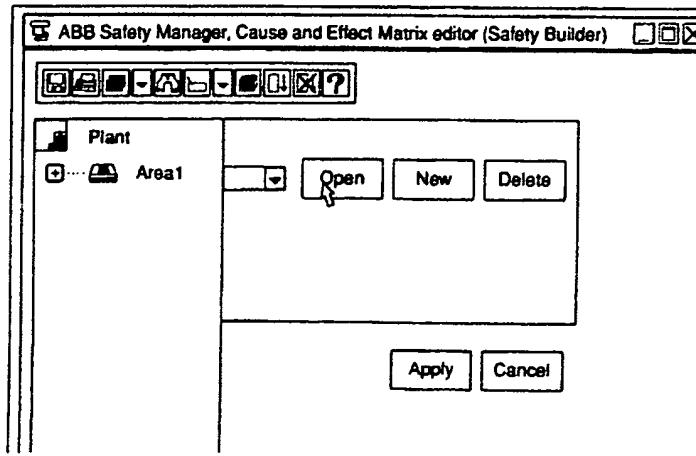
Fig. 2



1



2



3

Fig. 3

4

ABB Safety Manager, Cause and Effect Matrix editor (Safety Builder)

#	Name	Description	Designation	1	2	3	4	Effekt
1	ESDLevel1		ZLEV1					X
2								
3								
4								
5								
6								
7								
#	Name	Description	Designation	1	2	3	4	Effekt
1	Cause1		ZCAU1	X				X
2	regsts							
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								

5a

ABB Safety Manager, Cause and Effect Matrix editor (Safety Builder)

#	Name	Description	Designation	1	2	3	4	Effekt
1	ESDLevel1	ZLEV1						X
2	Cause1	ZCAU1	X					X
3	regsts							
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								

Fig. 3 cont.

ABB Safety Manager, Cause and Effect Matrix editor (Safety Builder)

Cause and Effect Matrix for AAA

	Name	Description	Designation	1	2	3	4	Effect	ID
1	ESDLevel1		ZLEV1					X	
2									
3									
4									
5									
6									
7									
	Name	Description	Designation	1	2	3	4	Effect	ID
1	Cause1		ZCAU1	X				X	
2	regsts								
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									

5b

ABB Safety Manager, Cause and Effect Matrix editor (Safety Builder)

Cause and Effect Matrix for AAA

	Name	Description	Designation	1	2	3	4	Effect	ID
1	ESDLevel1		ZLEV1					X	
2									
3									
4									
5									
6									
7									
	Name	Description	Designation	1	2	3	4	Effect	ID
1	Cause1		ZCAU1	X				X	
2	regsts								
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									

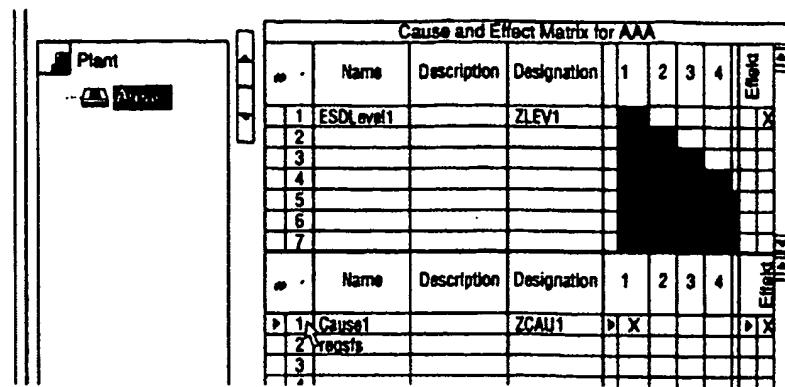
5c

	Name	Description	Designation	1	2	3	4	Effect	ID
1	Cause1		ZCAU1	X				X	
2	regsts								
3									
4									
5									
6									

6

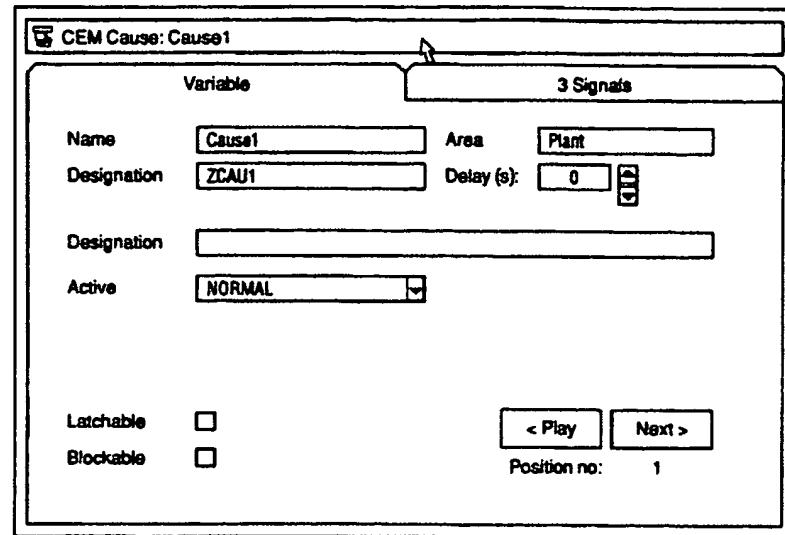
Fig. 3. cont.

6



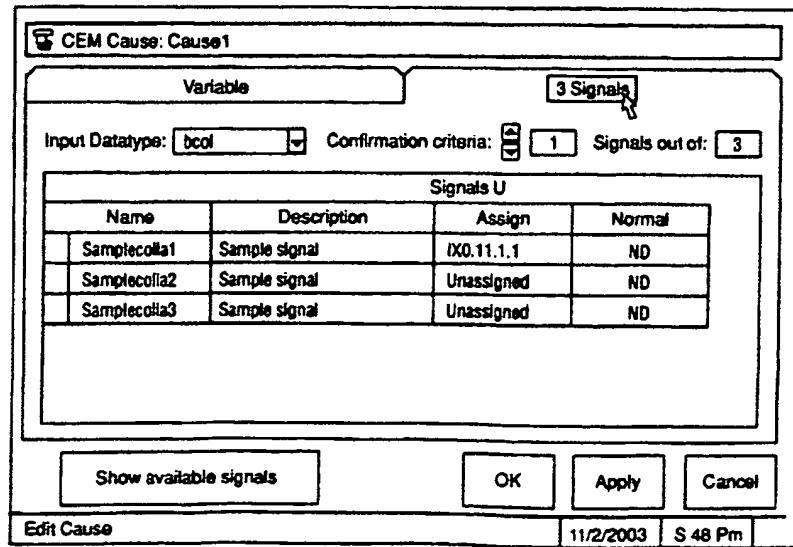
The screenshot shows a software interface with a left sidebar labeled 'Plant' containing a tree view with nodes like 'Area1', 'Area2', etc. To the right is a 'Cause and Effect Matrix for AAA'. The matrix has two rows of headers: 'Name', 'Description', 'Designation' and '1 2 3 4'. The first row contains 'ESD_Level1' and 'ZLEV1'. The second row contains 'Cause1' and 'ZCAU1'. There are several 'X' marks in the matrix cells, indicating causal relationships.

7a



This dialog box is titled 'CEM Cause: Cause1'. It has tabs for 'Variable' and '3 Signals'. Under 'Variable', fields include 'Name: Cause1', 'Area: Plant', 'Designation: ZCAU1', 'Delay (s): 0', 'Designation' (empty), 'Active: NORMAL', 'Latchable' (unchecked), and 'Blockable' (unchecked). Buttons for '< Play' and 'Next >' are at the bottom, along with 'Position no: 1'.

7b



This dialog box is also titled 'CEM Cause: Cause1'. It has tabs for 'Variable' and '3 Signals'. Under 'Variable', it shows 'Input Datatype: bcol', 'Confirmation criteria: 1/3', and 'Signals out of: 3'. Below is a table 'Signals U' with three rows:

Name	Description	Assign	Normal
Samplecolla1	Sample signal	IX0.11.1.1	ND
Samplecolla2	Sample signal	Unassigned	ND
Samplecolla3	Sample signal	Unassigned	ND

Buttons at the bottom include 'Show available signals', 'OK', 'Apply', and 'Cancel'. At the very bottom are 'Edit Cause', '11/2/2003', 'S 48 Pm', and a timestamp '11:22:48 PM 11/2/2003'.

Fig. 3. cont.

CEM Cause: Cause1	
Variable	
Input Datatype:	bcol
Confirmation:	
Signals	
Name	Description
Samplecolla1	Sample signal
Samplecolla2	Sample signal
Samplecolla3	Sample signal

7C

Hide available signals Hide signals

Signals

CEM Cause: Cause1	
Variable	
Input Datatype:	bcol
Confirmation:	
Signals	
Name	Description
Samplecolla1	Sample signal
Samplecolla2	Sample signal
Samplecolla3	Sample signal

7C

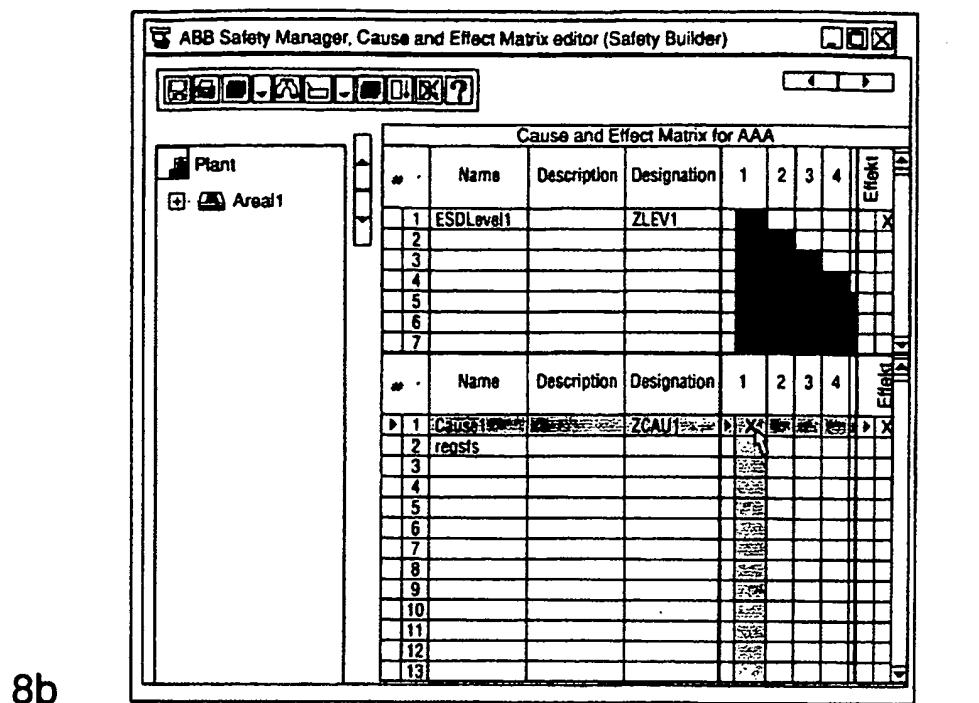
Edit Cause

8a

ABB Safety Manager, Cause and Effect Matrix editor (Safety Builder)

Cause and Effect Matrix for AAA											
#	Name	Description	Designation	1	2	3	4	Effect	1	2	3
1	ESDLevel1		ZLEV1					X			
2											
3											
4											
5											
6											
7											
#	Name	Description	Designation	1	2	3	4	Effect	1	2	3
1	Cause1		ZCAU1	X					X		
2	repsfs										
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											

Fig. 3 cont.



8b

#	Name	Description	Designation	1
1	ESDLevel1		ZLEV1	X
2				
3				
4				
5				
6				
7				

#	Name	Description	Designation	1
1				
2	regsts			X
3				
4				
5				
6				
7				

8c

Fig. 3 cont.

9

ABB Safety Manager, Cause and Effect Matrix editor (Safety Builder)

Cause and Effect Matrix for AAA								
#	Name	Description	Designation	1	2	3	4	Effect
1	ESDLevel1	ZLEV1	NO					X
2			NO					
3			NO					
4			NO					
5			NO					
6			NO					
7			NO					
#	Name	Description	Designation	1	2	3	4	Effect
1	DATA1	DATA1	NO					X
2	regsts		NO					
3			NO					
4			NO					
5			NO					
6			NO					
7			NO					
8			NO					
9			NO					
10			NO					
11			NO					
12			NO					
13			NO					

10

ABB Safety Manager, Cause and Effect Matrix editor (Safety Builder)

Digital Signals			
Name	Description	Assign	Normal Value
SampleboolIn1	Sample signal	IX0.11.1.1	ND
SampleboolIn2	Sample signal	Unassigned	ND
SampleboolIn3	Sample signal	Unassigned	ND
SampleboolOut4	Sample signal	Unassigned	ND
SampleboolOut5	Sample signal	Unassigned	ND
SampleboolOut6	Sample signal	Unassigned	ND

Digital Analog

Fig. 3 cont.

ABB Safety Manager, Cause and Effect Matrix editor (Safety Builder)

Digital Signals			
Name	Description	Assign	Normal Value
SampleboolIn1	Sample signal	IX0.11.1.1	ND
SampleboolIn2	Sample signal	Unassigned	ND
SampleboolIn3	Sample signal	Unassigned	ND
SampleboolOut4	Sample signal	Unassigned	ND
SampleboolOut5	Sample signal	Unassigned	ND
SampleboolOut6	Sample signal	Unassigned	ND

10

ABB Safety Manager, Cause and Effect Matrix editor (Safety Builder)

Controller

Controller name: CemController

IP Address: 172.16.0.0

Controller Type: AC 800M HI Create

Controller Hardware Units

- CemController.0
- ModuleBus

11

ABB Safety Manager, Cause and Effect Matrix editor (Safety Builder)

Controller

Controller name: CemController

IP Address: 172.16.0.0

Controller Type: AC 800M HI Create

Controller Hardware Units

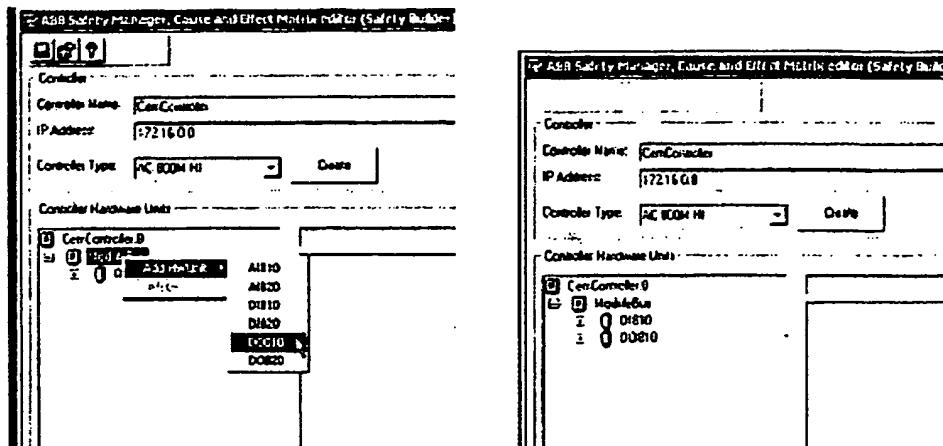
- CemController.0
- ModuleBus

Add HW Unit

- AI810
- AI820
- DI810
- DI810
- D0810
- D0820

12

Fig. 3 cont.

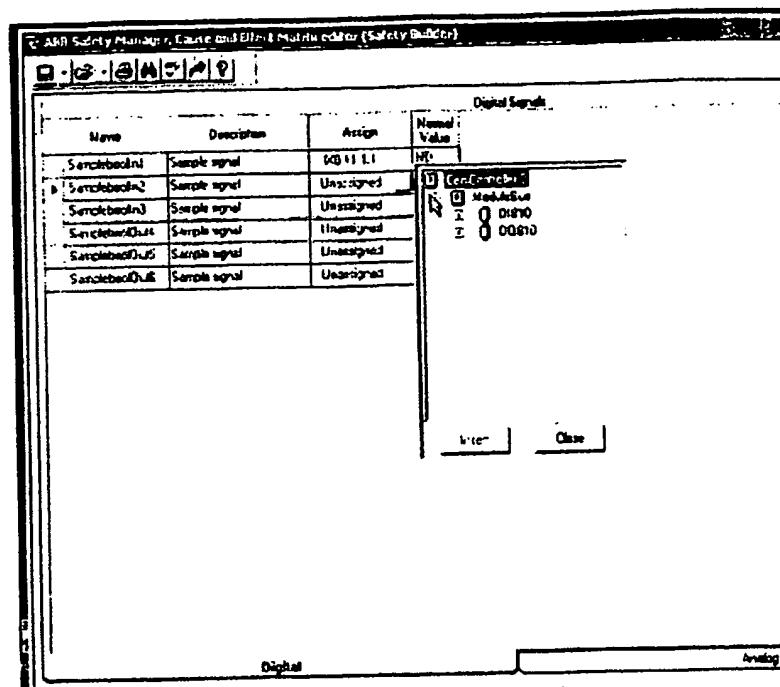


13

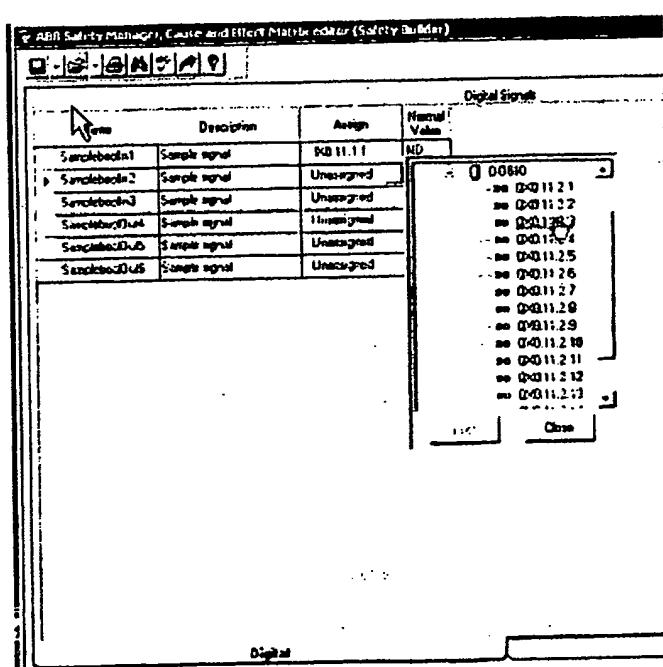
Digital Signals			
Name	Description	Assign	Normal Value
Sampleboard1	Sample signal	MD11.1.1	ND
Sampleboard2	Sample signal	Unassigned	ND
Sampleboard3	Sample signal	Unassigned	ND
Sampleboard4.0	Sample signal	Unassigned	ND
Sampleboard4.0.1	Sample signal	Unassigned	ND
Sampleboard4.0.2	Sample signal	Unassigned	ND

14

Fig. 3 cont.

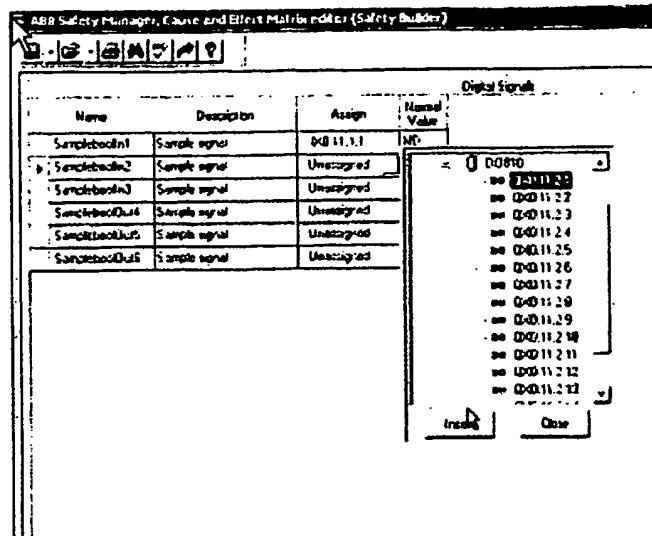


15a

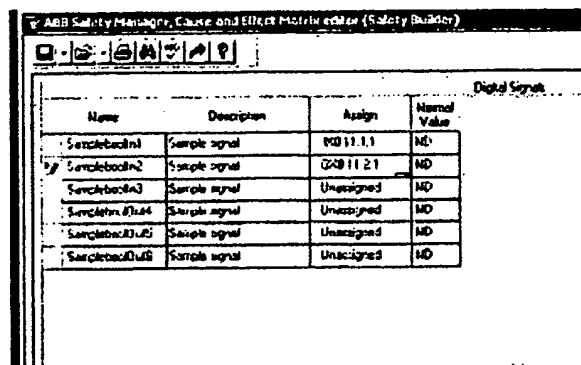


15b

Fig. 3 cont.



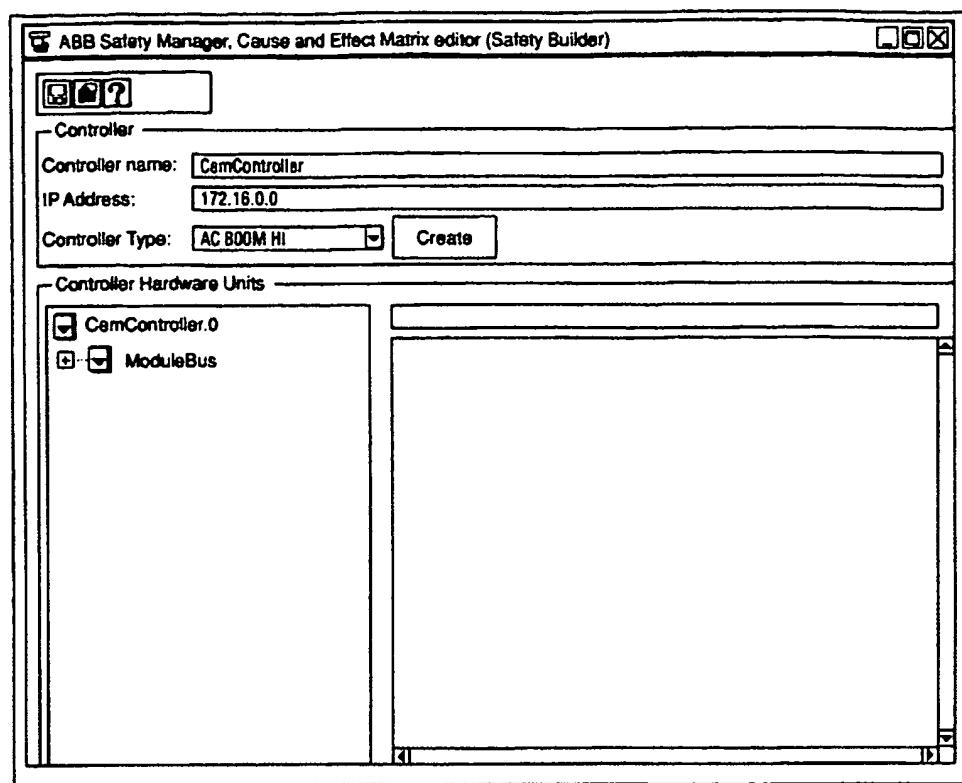
15c



16

Fig. 3 cont.

17



18

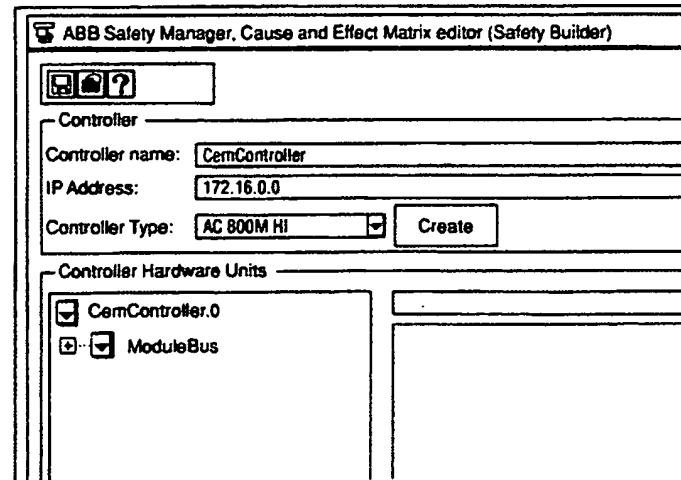
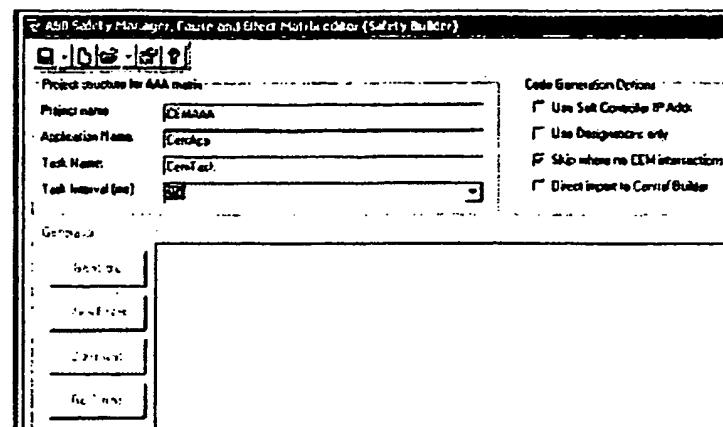


Fig. 3 cont.

19



20

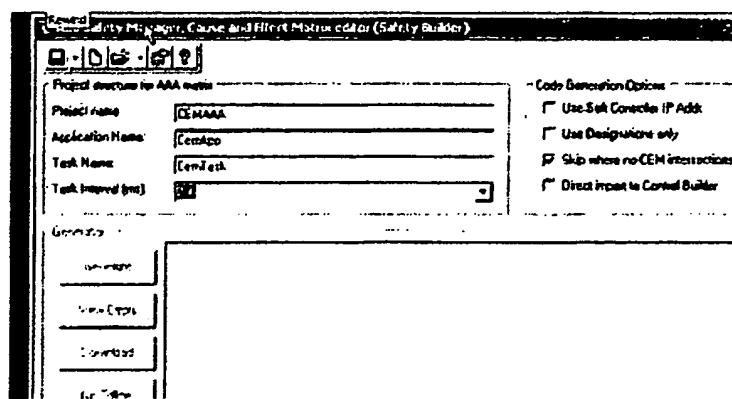


Fig. 3 cont.

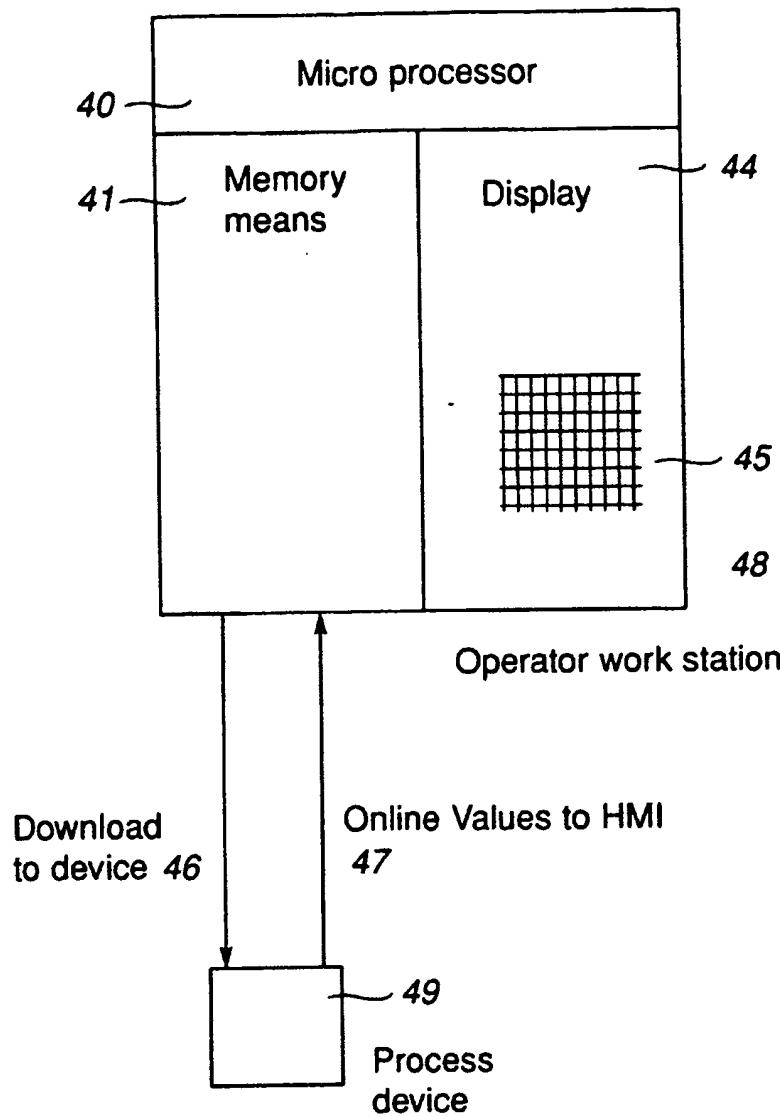


Fig. 4

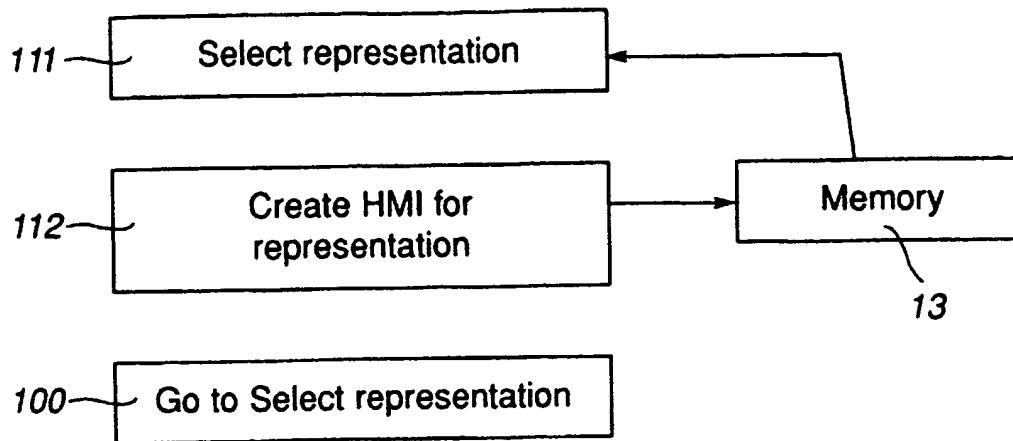


Fig. 5a

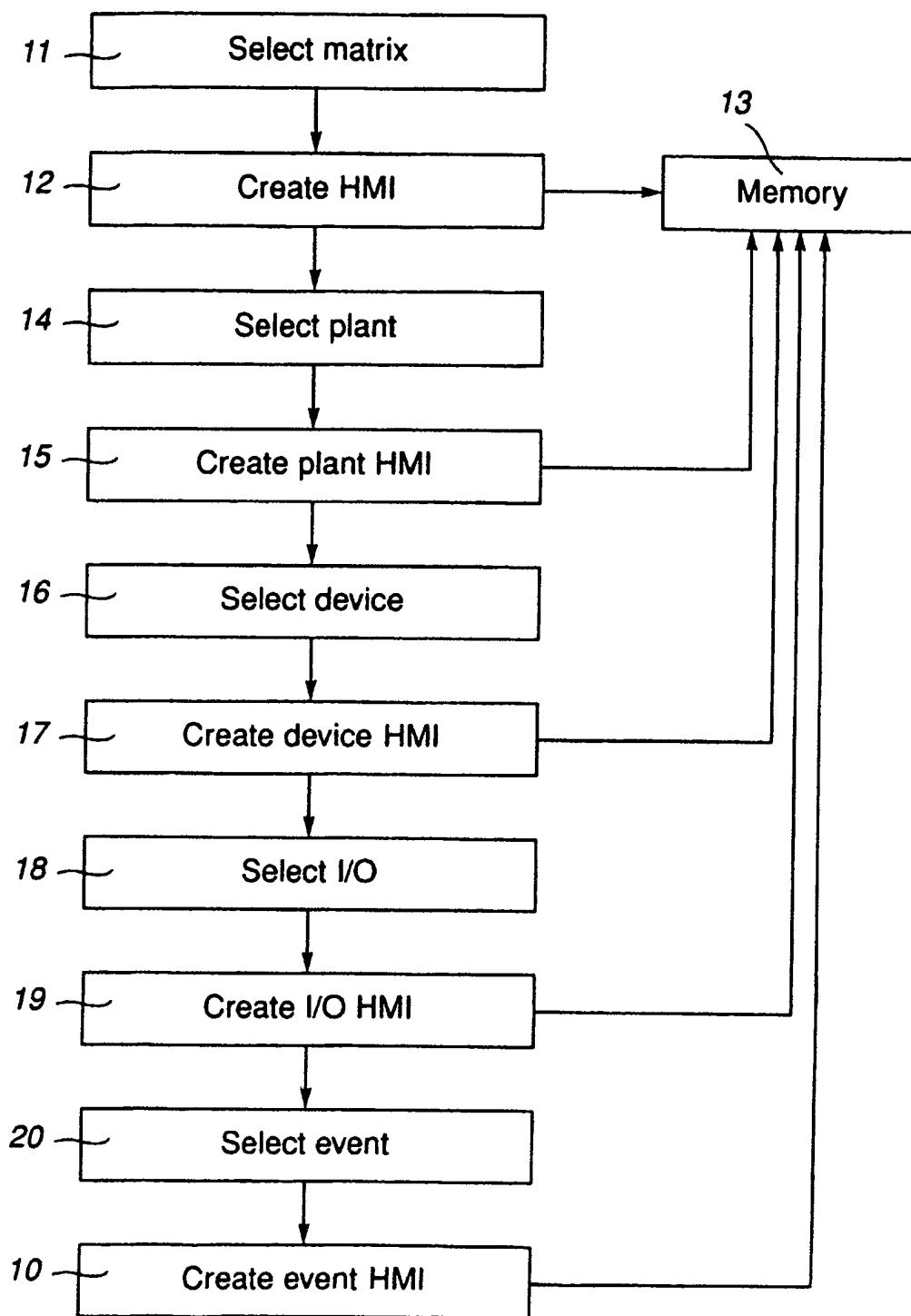


Fig. 5b

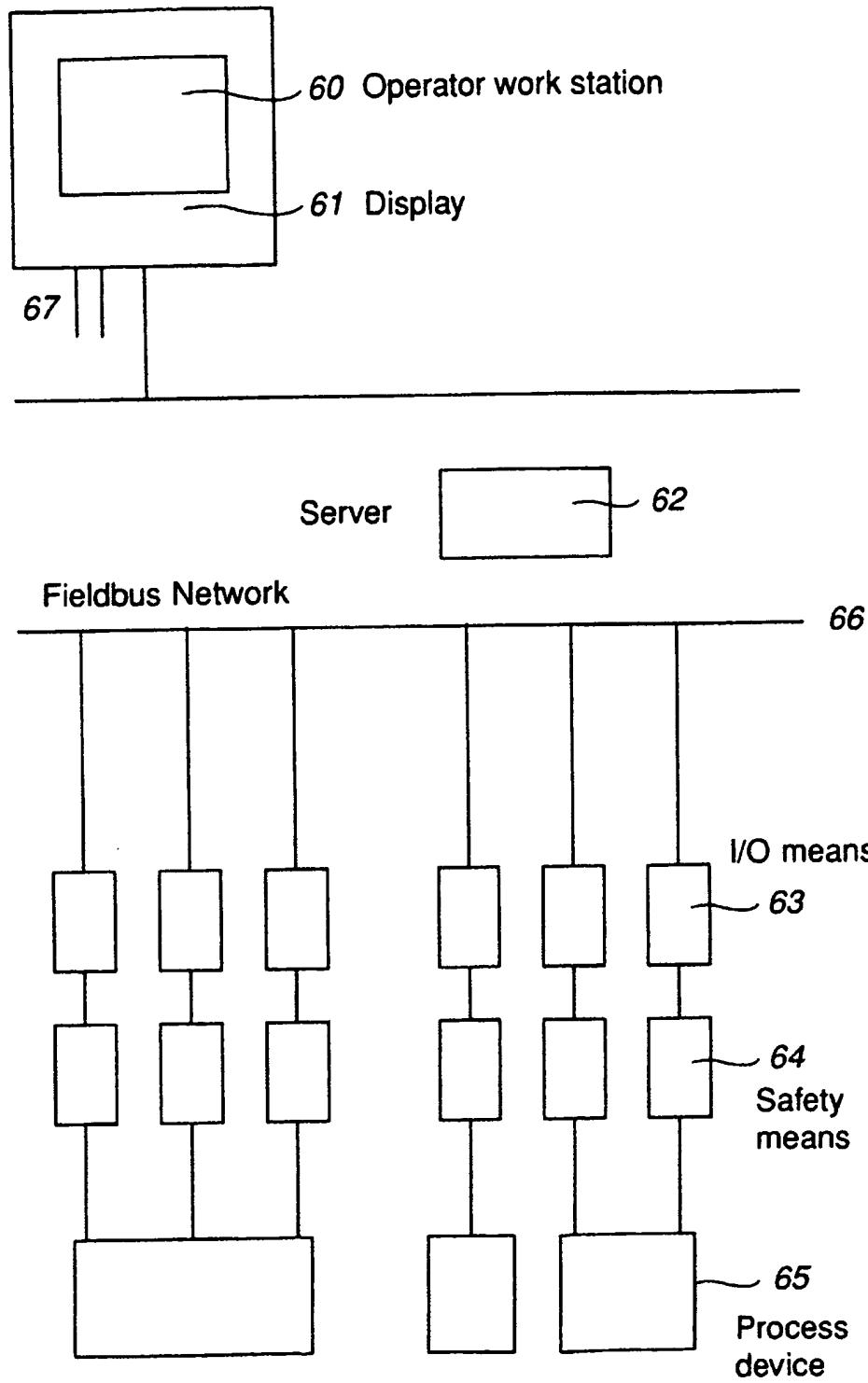


Fig. 6

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